

NEW SAXICOLOUS SPECIES OF *DITREMIS* Clements (LICHENIZED ASCOMYCOTINA, MONOBLASTIACEAE) FROM NEW ZEALAND AND HAWAII

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ABSTRACT

McCarthy, P. M. New saxicolous species of *Ditremis* Clements (Lichenized Ascomycotina, Monoblastiaceae) from New Zealand and Hawaii. *Muelleria* 8(1): 1-4 (1993). — *Ditremis laevigata* McCarthy sp. nov. and *D. pacifica* McCarthy sp. nov. are described from New Zealand and Hawaii, respectively. A key to the saxicolous species of *Ditremis* Clements is provided.

INTRODUCTION

Ditremis Clements is a small and predominantly corticolous genus of pyrenocarpous lichens with a trentepohlioid photobiont, fissitunicate asci, colourless 1(-3)-septate ascospores and an hamathecium of anastomosing pseudoparaphyses. In this paper, two new saxicolous species are described from the New Zealand and Hawaii.

THE SPECIES

Ditremis laevigata McCarthy, sp. nov.

Thallus epilithicus, continuus vel areolatus, laevigatus, pallide griseoviridis vel pallide fusco-griseus. Algae ad *Trentepohliam* pertinentes. Perithecia semiimmersa, (0.17-)0.24(-0.32) mm diametro. Involucellum 30-45 μ m crassum. Asci fissitunicati, 8-spori, cylindrici vel cylindro-clavati, (63-)72(-83) \times (13-)14(-16) μ m. Ascospores 1-septatae, obovatae vel clavatae, (12-)16.5(-22.5) \times (4.5-)6(-7) μ m.

HOLOTYPE: New Zealand, South Island, Dunedin, Bethune's Gully, 45°50'S, 170°33'E, on smooth siliceous rock, 4 feet above water level, Feb. 1957, J. Murray 1619 [part (OTA; ISOTYPUS AK 192342)].

Thallus epilithic, crustose, determinate, continuous to areolate, pale grey-green to pale brownish grey, UV-, K-, colour scarcely changing when wetted with water, matt, smooth, 0.06-0.1(-0.14) mm thick, impregnated with rock crystals. *Areolae* 0.3-0.6(-1) mm wide, regular or irregular, angular or rounded, plane. *Algae Trentepohlia*-like, subglobose, 7-14(-18) \times 7-12(-14) μ m. *Mycobiont cells* 2-3(-4) μ m wide. *Prothallus* not apparent. *Perithecia* compound, semi-immersed, very numerous, usually solitary, (0.17-)0.24(-0.32) mm diam. *Apex* rounded. *Involucellum* dull black, extending almost to excipulum-base level, 30-45 μ m thick. *Ostiole* apical, in a 20-30 μ m wide depression. *Centrum* subglobose to globose, 0.15-0.23 mm diam. *Excipulum* pale to dark brown at the base, medium to dark brown nearer the apex, 11-16 μ m thick. *Pseudoparaphyses* richly branched and anastomosing, septate. *Periphyses* absent. *Asci* fissitunicate, cylindrical to cylindro-clavate, 8-spored, (63-)72(-83) \times (13-)14(-16) μ m; contents IKI+ red-brown. *Ascus* wall 1.5-2.5 μ m thick at the sides, 4.5-6 μ m thick at the apex, IKI-; ocular chamber 1-2 μ m wide, 1-2.5 μ m tall, truncate or pointed. *Ascospores* colourless, 1-septate, irregularly biseriate in the ascus, obovate or clavate, distal cell usually larger, uniformly thin-walled, usually slightly constricted at the septum, (12-)16.5(-22.5) \times (4.5-)6(-7) μ m (64 measured); surface smooth, without an epispore; contents clear to finely granular. *Conidiomata* numerous, semi-immersed,

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black above, colourless below, 0.06–0.1 mm diam., with a non-convoluted conidiogenous layer and unbranched conidiophores. *Microconidia* and *macroconidia* not seen. (Fig. 1A, B).

OTHER SPECIMEN EXAMINED

New Zealand — South Island, Otago Peninsula, Broad Bay, Styles Creek, on siliceous rocks beside stream in shady bush gully, 1 Jun. 1991, *P. N. Johnson 201* (CHR 414088).

DISCUSSION

Ditremis laevigata is known from two localities in south-eastern New Zealand where it inhabits damp sheltered siliceous rocks. Although microconidia were not seen in the typus, 3–5(-6) × 2–3 µm propagules were seen in *Johnson 201*.

The new lichen may be distinguished from the boreal *D. carinthiaca* (Steiner) R. C. Harris [typus: Austria, Carinthia, near Klagenfurt, *J. Steiner* (W-syntypi !; US-isosyntypus !)] which has 0.13–0.25 mm diam. perithecia, with a centrum of 0.09–0.13 mm diam., 40–53 µm long asci, ascospores of 9–15(-17) × 3.5–6.5 µm and narrowly ellipsoid microconidia of 3–4.5 × 1–2 µm [seen only in the synonymous *Anisomeridium dimidiatum* (Fink) R. C. Harris; typus: United States of America, Connecticut, Ellsworth, 1895, *H. A. Green* (MICH-holotypus !)]. The newly-described *D. pacifica* (below) has a paler and very much thinner thallus than that of *D. laevigata*, larger perithecia and a discontinuously thicker involucrellum.

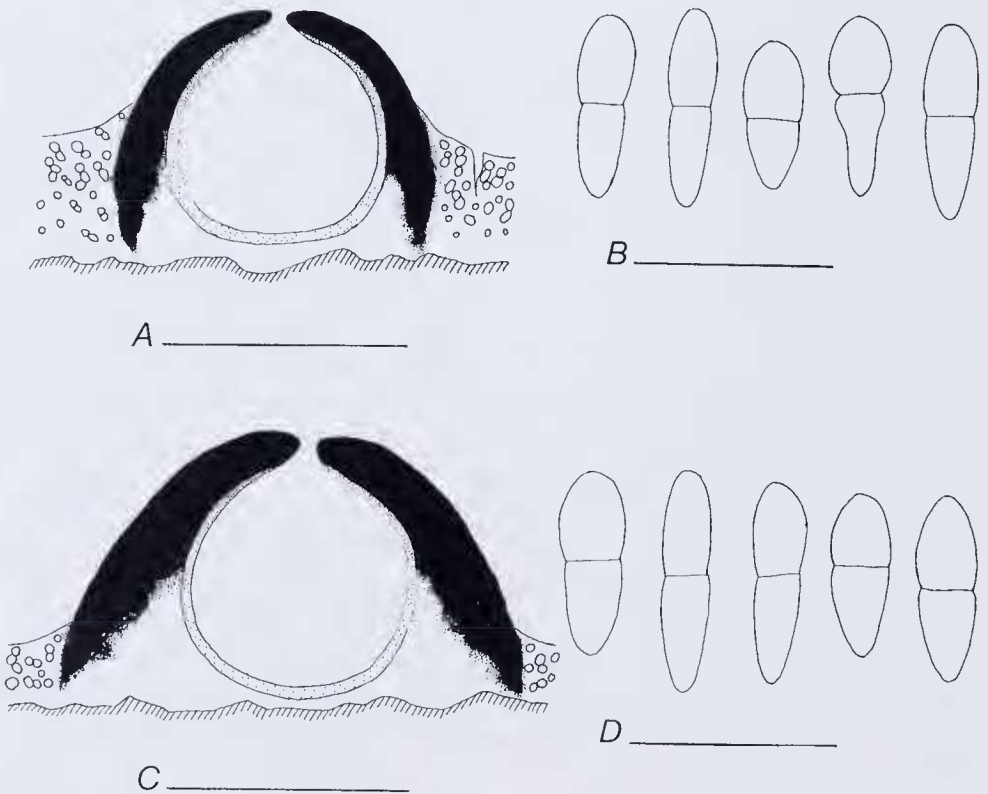


Fig. 1. *Ditremis laevigata*. A — vertical section of perithecium. B — ascospores. *Ditremis pacifica*. C — vertical section of perithecium. D — ascospores. Scales: A and C — 0.2 mm; B and D — 20 µm.

Ditremis pacifica McCarthy, *sp. nov.*

Thallus epilithicus, continuus vel rimosus, pallide viridogriseus. Algae ad *Trentepohliam* pertinentes. Perithecia fere superficialia, (0.24-)0.35(-0.44) mm diametro. Involucrellum 45-65 μ m crassum. Asci fissitunicati, 8-sporei, elongatae-cylindrici, (68-)75(-83) \times (11-)14(-17) μ m. Ascospores 1-septatae, obovatae vel elongatae-ellipsoideae, (15-)18.5(-21.5) \times (4.5-)6(-8) μ m. Microconidia lata ellipsoidea vel obovata, 3-5(-6) \times 1.5-2.5(-3) μ m.

HOLOTYPE: United States of America, Hawaiian Is., Oahu, Mokuleia, gulch NW of Peacock Flats, on shaded boulders in and near stream-bed, alt. 1200 feet, on siliceous rocks, 5 Mar. 1966, O. & I Degener 30381d (B 049768).

Thallus epilithic, crustose, diffuse to determinate, continuous to rimose, pale greenish grey, UV-, K-, colour scarcely changing when wetted with water, matt, smooth, 30-60 μ m thick, impregnated with rock crystals. *Algae Trentepohlia*-like, subglobose, 7-15 \times 7-12 μ m. *Mycobiont cells* 2-3 μ m wide. *Prothallus* not apparent. *Perithecia* compound, 1/3-immersed to superficial, very numerous, usually solitary, (0.24-)0.35(-0.44) mm diam. *Apex* rounded to somewhat flattened. *Involucrellum* dull black, extending almost to excipulum-base level, 45-65 μ m thick, brown-black in thin section. *Ostiole* apical, in a 60-120 μ m wide depression. *Centrum* subglobose to globose, 0.16-0.25 mm diam. *Excipulum* pale brown at the base, darkening towards the apex, 11-16 μ m thick. *Pseudoparaphyses* richly branched and anastomosing, septate, 0.7-1 μ m wide. *Periphyses* absent. *Asci* fissitunicate, elongate-cylindrical, 8-spored, (68-)75(-83) \times (11-)14(-17) μ m; contents IKI+ red-brown. *Ascus wall* 1.5-2.5(-3) μ m thick at the sides, 4-6 μ m thick at the apex, IKI-; ocular chamber c. 3 μ m wide, 1-1.5 μ m tall, hemispherical or truncate. *Ascospores* colourless, 1-septate, irregularly biseriolate in the ascus, obovate or elongate-ellipsoid, distal cell frequently larger, uniformly thin-walled, usually slightly constricted at the septum, (15-)18.5(-21.5) \times (4.5-)6(-8) μ m (50 measured); surface smooth, without an epispore; contents clear. *Conidiomata* numerous, semi-immersed to almost superficial, black and hemispherical to subconical above, colourless below, 0.09-0.13 mm diam., with a non-convoluted conidiogenous layer and unbranched conidiophores. *Microconidia* broadly ellipsoid to obovate, 3-5(-6) \times 1.5-2.5(-3) μ m. *Macroconidia* not seen. (Fig. 1C,D).

DISCUSSION

Ditremis pacifica is characterized by a thin pale thallus, perithecia are larger than those of other known saxicolous *Ditremis*, 1-septate ascospores and ellipsoid to elongate-ellipsoid microconidia. It is known only from its Hawaiian type locality. It is rather close to *D. laevigata*, from which it may be separated by its thinner and paler thallus, larger perithecia and thicker involucrellum.

KEY TO THE SAXICOLOUS SPECIES OF *DITREMIS*

- | | |
|---|---|
| 1 Ascospores persistently 1-septate..... | 2 |
| 1 Ascospores 1-3-septate..... | 5 |
| 2 Thallus endolithic, calcicolous. Perithecia immersed to emergent. Asci 105-125 \times 15-18 μ m. Ascospores 20-25 \times 6.5-8.5 μ m. Microconidia 3-5 \times 1-1.5 μ m. Puerto Rico and Florida (Harris 1990)..... | D. finkii R. C. Harris |
| 2 Thallus epilithic, silicolous. Asci less than 85 μ m long..... | 3 |
| 3 Asci 40-53 \times 10-15 μ m. Ascospores 9-15(-17) \times 3.5-6 μ m. Perithecia (0.13-)0.19(-0.25) mm diam.; centrum 0.09-0.13 mm diam. Austria, Sweden, north-eastern U. S. A.. (Clauzade & Roux 1985, Harris 1975)..... | D. carinthiaca (Steiner) R. C. Harris [syn. <i>Anisomeridium dimidiatum</i> (Fink) R. C. Harris] |
| 3 Asci 63-83 \times 11-17 μ m. Ascospores 12-22.5 \times 4.5-8 μ m. Perithecia 0.17-0.44 mm diam.; centrum 0.15-0.23 mm diam..... | 4 |

- 4 Thallus 60–140 μm thick, pale grey. Perithecia (0.17-)0.24(-0.32) mm diam.; involucrellum 30–45 μm thick. New Zealand.....**D. laevigata** McCarthy
- 4 Thallus 30–60 μm thick, pale grey-green to pale brown-grey. Perithecia (0.24-)0.35(-0.44) mm diam.; involucrellum 45–65 μm thick. Hawaiian Is.**D. pacifica** McCarthy
- 5 Ascospores 1–3-septate, 16–22 \times 6.5–8 μm . Microconidia narrowly elliptical, 4–5 \times 1.5–2 μm . North-eastern U. S. A.. (Harris 1975) **D. distans** (Willey) R. C. Harris
- 5 Ascospores 3-septate, 21–36.5 \times 7.5–13 μm . Microconidia bacilliform, 2.5–4 \times 0.7 μm . New South Wales (McCarthy 1992) **D. australiensis** McCarthy

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